HOUSATONIC RIVER

CONNECTICUT

SURVEY

(REVIEW OF REPORTS)

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS WALTHAM, MASS.

SEPTEMBER 1965

28

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS. 02154

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO. NEDED-R

9 September 1965

SUBJECT: Survey (Review of Reports) on the Housatonic River, Connecticut

TO: Chief of Engineers
ATTN: ENGCW-PD

1. The navigation survey study, authorized by a resolution adopted 12 April 1956 by the Committee on Public Works of the United States Senate, has been completed. The report is unfavorable to Federal participation in navigation improvements of the Housatonic River.

2. In accordance with EM 1120-2-101, paragraph 1-126, there are inclosed:

a. Copies 16 through 28 of subject report;

b. Two copies of the letter of transmittal to the Board of Engineers for Rivers and Harbors;

c. Three copies of a reduced size display map;

d. Fifteen (15) copies of the public notice of the report and one copy of the mailing list;

e. Five copies of Supplement S-148 in addition to those bound in the report;

f. A copy of the transcript of the public hearing.

NEDED-R 9 September 1965
SUBJECT: Survey (Review of Reports) on the Housatonic River, Connecticut.

3. Advance copies of the public notice of the report are scheduled to be sent to Congressmen on 16 September 1965. Public release of the notice is planned for 23 September 1965.

Incls
as

E. J. RIBBS
Colonel, Corps of Engineers
Acting Division Engineer

SURVEY (REVIEW OF REPORTS)
HOUSATONIC RIVER, CONNECTICUT

SYLLABUS

The Division Engineer finds that prospective benefits to recreational boating would be sufficient to warrant navigational improvement of the Housatonic River, Connecticut. The improvements, consisting of two anchorages, are located in the municipalities of Stratford and in Milford. Both anchorages would be 6 feet deep and have areas of 23 and 9 acres respectively. The estimated cost of construction is $204,000, excluding $8,400 for preauthorization studies and about $400 for additional aids to navigation. He further finds that the benefits to be realized are 50 percent general and 50 percent local. In view of this, he considers that as a requirement of local cooperation, local interests should contribute in cash 50 percent of the first cost of construction presently estimated at $102,000. Local interests have indicated that they are unwilling to participate in the cost of the proposed improvement. Therefore, the Division Engineer recommends no further improvement of the river at this time.

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NEDED-R 9 SEP 1965

SUBJECT: Survey (Review of Reports) Housatonic River, Connecticut

TO: Chief of Engineers
ATTN: ENGCW-PD

AUTHORITY

1. This report is submitted in compliance with a resolution, adopted 12 April 1956 by the Committee on Public Works of the United States Senate. The resolution reads as follows:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved 13 June 1902, be and is hereby, requested to review the report of the Chief of Engineers on the Housatonic River, Connecticut, published as House Document numbered 449, Seventieth Congress, Second Session, with a view to determining whether any modification of the existing project is advisable at the present time."

2. A review report was assigned to the New England Division by letter of the Chief of Engineers under date of 10 May 1956.

PURPOSE AND EXTENT OF STUDY

3. This study was made to determine the feasibility of modifying the existing Federal navigation project as requested by local interests. The study necessitated a detailed hydrographic survey, including soundings and probings made in 1964 to determine the nature and extent of materials to be dredged in any plan of improvement. Available maps, charts, aerial photographs, commercial statistics, and other data pertaining to the waterway were reviewed throughout the study. Information obtained at a public hearing held in the Stratford Town Hall on 5 March 1958, is described later in this report under "IMPROVEMENTS DESIRED". This information has been further supplemented by subsequent contacts with local interests.

All Federal, State and local agencies interested in the project have been consulted during the study and their views are included in the report.

DESCRIPTION OF NAVIGATION CONDITIONS

4. The Housatonic River, originating in the Berkshire Hills of northwestern Massachusetts near Hinsdale, flows northerly for a short distance and then turns generally in a southerly direction through Massachusetts and Connecticut emptying into Long Island Sound. Its mouth is located 5 miles east of Bridgeport Harbor between Stratford and Milford.

5. The river has a total drainage area of 1948 square miles including parts of western Massachusetts and Connecticut, plus a small area in eastern New York. A maximum discharge of 150,000 cubic feet per second was recorded at the junction of the Naugatuck River during Hurricane "Diane" in 1955. The average annual flow at the same point is 3100 cubic feet per second.

6. The tidal portion of the Housatonic River extends from its mouth about 14.5 miles to a lock and dam in Shelton, Connecticut. A Federal channel, extending northward from Long Island Sound for 13.75 miles, terminates just above the confluence of the Naugatuck and Housatonic Rivers. Navigation for craft drawing up to 3 feet, is possible for a distance of about 3 miles above the dam. Beyond this reach, the river has a steep slope and is restricted by several small power dams located at upstream rapids.

7. The entrance to the river is protected by a breakwater which extends from the east side of the estuary, generally southeasterly, into Long Island Sound. The breakwater, built in two sections, consists of an inner half-tide arm with a top elevation of 3 feet above mean low water, and an outer arm with a top elevation of 6 feet above mean low water. The outer arm is in generally good condition, while the inner structure has deteriorated with large sections awash during low tides.

8. The Federal navigation channel in the river has an authorized depth of 18 feet extending from the Sound to Culvers bar and thence 7 feet to the end of the project. Controlling depths (1963) were generally 17 feet in the 18-foot channel and 3 feet in the 7-foot channel. The mean tidal ranges are 6.7 feet at the mouth, 5.5 feet at Stratford and 5.0 feet at Shelton. All depths in this report refer to the plane of mean low water, as established by the United States Coast and Geodetic Survey. The area is shown on the U.S.C. & G.S. Chart No. 219, on Army Map Service Quadrangle Sheets and on maps accompanying this report.

TRIBUTARY AREA

9. The immediate tributary area to the navigable portion of the river extends northward from Long Island Sound. It is made up of Stratford and Shelton on the west, and Milford, Orange and Derby on the east. Devon is a subdivision of Milford and is the area of chief concern for that city, in consideration of improvement of the river. The 1960 combined population for the five municipalities was 125,543 and the total real estate valuation was $640,703,764 (Connecticut State Manual, 1963).

10. Practically all waterborne commerce on the Housatonic River is carried on the 18-foot Federal channel. Stratford is a highly industrialized community possessing 95 industries employing about 11,000 persons. Its industries produce electronic components, aircraft engines, helicopters, plumbing fixtures, heating fixtures, valves and fittings. Three boatyards capable of building or repairing small craft are located in Stratford. Industries in Milford produce jigs, fixtures, aircraft parts, electrical connectors, and safety razors. Derby and Shelton are also manufacturing towns, while Orange is only semi-industrialized. The need for improvement is that associated with recreational boating. Expanding recreational fleets and lack of suitable facilities for mooring of these vessels are cited as having an adverse effect on the economy of the area.

BRIDGES

11. There are seven bridges crossing the Housatonic River between its mouth and Shelton of which only three cross the river within the project area. Pertinent data on these bridges are contained in the following table.

Name and Use	Owner	Vertical Clearance Above MHW	Vertical Clearance Above MLW	Horizontal Clearance	Type
Stratford-Devon (Highway)	Conn. State Hwy. Dept.	32	37	125	Bascule
Conn. Turnpike (Highway)	Conn. State Hwy. Dept.	65	70	100	Fixed
Devon (Railroad)	N.Y.N.H. & H. R.R. Co.	19	25	83	Bascule

PRIOR REPORTS

12. The Housatonic River has been the subject of several previous reports. The reports, which form the basis for the existing project, are described in the following table:

Document	Improvement Considered and Recommended	Action By Congress
H. Doc. 95, 41st Cong. 3d Sess., Annual Report 1871, P. 781	A jetty at sow and Pig Rocks and the present project width of channel across outer bar.	Authorized R&H Act 3 Mar 1871
S. Doc. 103, 50th Cong. 1st Sess., & Annual Report, 1888, P. 554	Breakwater at mouth of present project, dimensions of the channel above lower end of Culvers Bar.	Authorized R&H Act 11 Aug 1888
Authorized by Dept. Project Submitted by The District Engineer 15 July 1892.	The Stratford Dike.	
H. Doc. 449, 70th Cong. 2d Sess.	18-foot channel to Culvers Bar.	Authorized R&H Act 3 July 1930

EXISTING CORPS OF ENGINEERS' PROJECTS

13. The existing Corps of Engineers' project for the Housatonic River was adopted March 3, 1871, and modified by Acts of August 11, 1888 and July 3, 1930. The project provides for a channel 18 feet deep, 200 feet wide from Long Island Sound to the lower end of Culvers Bar, thence 7 feet deep, 100 feet wide to Derby and Shelton. The two channel depths extend for distances of five and eight miles respectively. The project also provides for a 5,800-foot long rubble stone breakwater on the east side of the harbor entrance, a 1,500-foot long rubble stone dike at Stratford, and a 163-foot long stone training dike at Sow and Pigs Rock. The existing project was completed in 1957. The total Federal costs of the existing project have been $1,297,733, of which $859,691 was for new work, and $438,042 was for maintenance. In addition, the sum of $22,000 from contributed funds was expended for new work.

LOCAL COOPERATION ON EXISTING AND PRIOR PROJECTS

14. The 18-foot channel was authorized by the River and Harbor Act of 3 July 1930 and was subject to a local cash contribution of $150,000 toward the first cost of construction and the provision that local interests furnish, free of cost to the United States, suitable bulkheaded areas for the deposit of dredged materials, or in lieu thereof, an additional $50,000 in cash. Local interests complied with the requirements and the 18-foot channel was completed in 1956. The total actual costs for local cooperation amounted to $222,000, including a cash contribution of $167,000 and $55,000 in cash in lieu of furnishing bulkheaded spoil areas. The foregoing were the only conditions of local cooperation required for the existing navigation project.

OTHER IMPROVEMENTS

15. No other general navigational improvements have been made by local interests. In 1956 and 1957, the Small Business Administration loaned about $55,000 to the Town of Stratford for removing silt deposited by the 1955 flood.

TERMINAL AND TRANSFER FACILITIES

16. Terminal and transfer facilities located along the lower five miles of the Housatonic River include 11 commercial landings. Of these, five are located in Devon and six in Stratford. The landings consist of bulkheads, piers, floats, or various combinations of these structures. The major recreational marine facilities are located near Ferry Creek in Stratford and between the Connecticut Turnpike and Route 1 Highway (Washington Ave.) bridges in Devon (Milford).

17. The shoreline of Stratford in the vicinity of Ferry Creek is improved with three boatyards, a municipal dock, public access ramps, two yacht clubs restricted to members only, a marine supply shop, and one of the commercial wharves. One boatyard has a marine equipped to service 50 boats. The combined storage capacity of the boatyards is about 230 boats. The boatyards have a total of 7 marine railways with capacities from 15 to 100 tons, one 25-ton travel lift and two 25-ton trailer railways. Numerous private landings, ramps, and piers line both shores of this reach. At the present time, a fleet of about 270 recreational boats are permanently based in the area.

18. Waterfront development between the bridges consists of a large coal terminal on the west bank and several private landings, a marine sales store, a yacht club, and a public launching ramp on the east bank. There are about 40 small boats based in this area.

19. The terminal facilities along the 7-foot channel in the reaches above Devon consist of a yacht club, two boatyards, and a small marina. The boatyards have a storage capacity for 40 to 50 boats. Facilities available at these installations consist of a small marine railway, hoisting equipment and several small floats and docks. About 60 recreational boats use this reach of the river as home port.

IMPROVEMENTS DESIRED

20. A public hearing was held in the Town of Stratford on 5 March 1958 to determine the nature and extent of navigation improvements desired by local interests. The hearing was attended by 186 persons representing State and municipal governments, boatyard and marina owners, yachting interests, local industries and town residents.

21. Testimony presented at the hearing indicated that 10 improvements were desired by various interests. Of these, the deepening of two natural anchorages, located adjacent to the 18-foot channel, appeared to be the principal improvements desired. Stratford requested dredging a 6-foot anchorage, 150 to 600 feet wide, to be located west of the channel and extending about 3300 feet northward from Ferry Creek. Milford requested a five-foot anchorage to be located east of the channel between the Washington Ave. and Connecticut Turnpike bridges.

22. Three proposals for the lower river were found to be too costly to be warranted or to be beyond the scope of this report. The first of these proposals called for the provision of a small boat opening in the breakwater. This improvement would require considerable dredging to provide an adequate access channel to the opening for small boats. The opening would decrease the effectiveness of protection offered by the existing structure. Preliminary consideration of this proposal indicated that it would not be economically justified. The other two proposals concerned dredging Beaver Brook and improving the offshore area of Short Beach. The dredging of Beaver Brook from its mouth to Naugatuck Pier in Milford would not be justified due to the limited number of boats using, or anticipated to use, the waterway. The dredging of the offshore section of Short Beach to improve swimming conditions was not considered in this report.

23. Much of the testimony presented at the hearing dealt with post flood shoaling within the 7-foot Federal channel. It was stated that

maintenance of the channel, to its former limits, would lessen upstream flood problems and would enhance the river for recreational boating and commercial shipping. It was stated that the restored 7-foot channel would attract 60,000 short tons of commerce annually.

24. The remaining proposals offered by local interests involved (1) the dredging of the confluence of the Housatonic River and Naugatuck River to reduce flooding in that restricted area; (2) the widening of the channel near the Sikorsky Plant for flood reduction and to provide access to a basin proposed by the Company for the testing of amphibious helicopters; (3) the dredging of a channel from the end of the Federal project to the lock and dam at Shelton and (4) the dredging of an anchorage in the vicinity of Drews Bar. The proposals intended for flood control are beyong the scope of this report. It has been determined that the conditions existing north of the Federal project and in the vicinity of Drews Bar are satisfactory for present needs and warrant no further study at this time.

EXISTING AND PROSPECTIVE COMMERCE

25. Commerce on the river consists of traffic carrying coal and petroleum products to the coal dock in Stratford and to the 479 megawatt thermal electric plant operated by the Connecticut Light and Power Company in Milford. Commerce on the river in 1963 amounted to 884,380 tons, consisting of about 97 percent bituminous coal and lignite with the remainder made up of diversified petroleum products. All commerce prevails in the 5-mile stretch of river below Culvers Bar. In the latest 10-year period for which statistics are available, commerce on the river has fluctuated to some extent. The 5-year period from 1954 to 1958 had an average annual commerce of 792,600 tons. During the next 5-year period, commerce increased to an annual average of 942,800 tons with a high of 1,023,606 tons in 1959.

26. Commerce is expected to remain substantially the same during the anticipated project life. No increase is expected as little indication of additional prospective commerce was adduced either at the hearing or in subsequent contacts with local interests. There are no known plans for expansion of the thermal electric plant.

27. A comparative statement of traffic for the most recent 10-year period together with a detailed statement of 1963 traffic is tabulated on the following page.

HOUSATONIC RIVER
COMPARATIVE STATEMENT OF TRAFFIC

Year	Tons	Year	Tons
1954	706,185	1959	1,023,606
1955	695,844	1960	880,737
1956	842,476	1961	963,208
1957	788,663	1962	962,101
1958	929,819	1963	884,380

FREIGHT TRAFFIC 1963
(SHORT TONS)

Commodity	Total	Coastwise Receipts	Upbound
Total	884,380	739,179	145,201
502 Bituminous coal & lignite	855,579	710,378	145,201
510 Gas, oil, distillate fuel oil	6,593	6,593	-
513 Kerosene	2,151	2,151	-
514 Residual fuel oil	12,214	12,214	-
516 Petroleum Asphalt	7,843	7,843	-
Total ton-miles 4,421,900			

VESSEL TRAFFIC

28. Commercial navigation in the river is presently limited to small motor vessel and barge traffic. In 1963, the deepest draft vessels using the channel drew 13 feet. The total reported vessel traffic in 1963 amounted to 944 trips. Tabulated below are the vessel trips for 1963. The 1963 trips represent about average commercial traffic.

29. The recreational fleet associated with Stratford, according to testimony presented in 1958 at the public hearing, numbered 365 boats excluding rowboats having an estimated value of $1,800,000. Listed in the fleet were a number of small sail and outboard motor boats, cruisers up to 50 feet in length, and auxiliary sailboats ranging from 15 to 60 feet. Local interests anticipated that during the five-year period subsequent to the hearing, 225 new boats (including 150 outboards) would be added to the fleet. It was estimated that, upon completion of the desired improvement, 30 to 40 boats would transfer to Stratford and the transient fleet reported

to be 815 boats (valued at $8,000,000) would expand to 1200. Testimony relative to boating in the Devon area stated that 150 outboards and cruisers were moored in the anchorage located east of the channel and between the bridges.

30. A field inspection was made in June 1964 to determine if the anticipated expansion of the fleet had materialized. On the day of the inspection, about 270 boats were using waterfront facilities in the vicinity of Ferry Creek. Fifty of the observed boats were moored in the natural anchorage. Marinas located north of Ferry Creek were filled nearly to capacity with large inboard and outboard cruisers. One marina owner stated that he was in the process of adding 100 spaces to his facilities. It was estimated that with this planned expansion of marina space, the existing harbor facilities would provide space for a home fleet of 370 boats. Similarly, from observations made in Devon, it was found that the fleet associated with that area included 40 boats tied in slips and 20 boats moored offshore.

DIFFICULTIES ATTENDING NAVIGATION

31. The principal difficulties attending navigation are those which evolve from inadequate anchorage for the many recreational boats that use the waterway. Hazards to navigation result from boats anchoring in the existing 18-foot channel. Some minor damage to anchored boats has been caused by passing barge traffic.

WATER POWER AND OTHER SPECIAL SUBJECTS

32. There are no matters involving water power, flood control, pollution or related subjects within the scope of this study. The requested improvement would have no adverse effect on either fish or wildlife.

PLAN OF IMPROVEMENT

33. In arriving at the plan of improvement, due consideration was given to all proposals presented by local interests. Restoration of the existing 7-foot project channel could be accomplished on a maintenance basis providing that favorable findings resulted from a study of existing and prospective traffic. Dredging to deeper limits would not be warranted due to the limited volume of commerce expected. Two anchorages, one located in Stratford and the other in Milford, were found to be worthy of consideration.

34. A comparison of recent and past sounding data verified claims that much of the existing shoaling resulted from the 1955 flood. This, plus

TRIPS AND DRAFTS OF VESSELS

	UPBOUND					DOWNBOUND				
	SELF PROPELLED VESSELS		NON-SELF PROPELLED VESSELS		TOTAL	SELF PROPELLED VESSELS		NON SELF PROPELLED VESSELS		TOTAL
	Tanker	Towboat or Tugboat	Dry Cargo	Tanker		Tanker	Tow-boats or Tugboat	Dry Cargo	Tanker	
13	2	-	405	3	410	-	-	-	-	-
12	3	14		1	18		14			14
11	1	16	82	4	103		15			15
10		403	1		404		403			403
9		3			3	1	3			4
8		5			5	5	5			10
6 and less			1		1		1	489	8	498
TOTAL	6	441	489	8	944	6	441	489	8	944
Total Net Register	3843	45297	365998	9386	424524	3843	45297	365998	9386	424524

a continued accretion of silt, has caused a steady decline in recreational boating. Natural anchorage space has been reduced to the extent that the anchored recreational fleet is now infringing on the 18-foot channel.

35. The selected plan provides for deepening the two natural anchorages to 6 feet, a depth considered adequate for the current and prospective fleet. The Stratford anchorage would provide about 23 acres of mooring area and would extend from about 1,000 feet south of to 2,000 feet north of the abandoned navigation beacon. The improvement of the anchorage would necessitate removal of the beacon foundation. The requirement for 23 acres of anchorage is predicated on space requirements for:

a. Sixty boats currently moored in the area;

b. An estimated 35 boats expected to return to Stratford after completion of the project;

c. An addition of 60 new boats to the existing fleet, and

d. Forty transient boats presently using the river or expected to be attracted by the improvement. The transient fleet is based on a 180-day boating season with 40 boats visiting the river on a day.

36. The Milford improvement would provide a 9-acre anchorage located east of and adjacent to the 18-foot channel. It would be located between the Washington Ave. and Connecticut Turnpike bridges. The requirements for a 9-acre anchorage was based on the following:

a. An addition of 24 new boats;

b. Forty boats currently moored in the immediate area;

c. Ten boats temporarily anchored in vicinity of public landing site.

37. The plan of improvement was discussed with officials of Stratford and Milford. Both municipalities were in accord with the plan.

SHORELINE CHANGES

38. The dredging of the two anchorages will cause no significant change in the shoreline of the Housatonic River.

AIDS TO NAVIGATION

39. The United States Coast Guard has been consulted on the need for additional aids to navigation and on the removal of the abandoned beacon foundation from the Stratford anchorage. The agency has indicated that the improvement will require the installation of two 5th class can buoys and one 5th class nun buoy at an initial cost of about $400 and an annual maintenance of $240. They further estimate that the removal of the beacon base would cost $25,000. The report of the U. S. Coast Guard is contained in Appendix B.

ESTIMATE OF FIRST COST

40. An estimate of the first cost of the improvement considered in this report has been made using price levels prevailing in June 1965. Probings made during the survey indicate that materials to be dredged consist of mud, sand, and a small amount of stone which comprises the foundation of the abandoned beacon. Utilizing in-place measurements, the quantity estimate is based on dredging to project depth, side slopes of one vertical to three horizontal and an allowance of one foot for overdepth. It is considered that the material will be removed by bucket dredge and the spoil barged to disposal areas located offshore.

41. The estimated first cost of the improvement including contingencies is shown in the following tabulation. Detailed costs are included in Appendix A.

ESTIMATED FIRST COST

Stratford Anchorage		
Dredging	$ 116,000	
Rock Removal	$ 10,000	(1)
Milford Anchorage		
Dredging	25,600	
	$ 151,600	
Contingencies (15%)	23,000	
	$ 174,600	
Engineering and Design	15,000	
Supervision and Administration	14,400	
Construction Costs	$ 204,000	
Aids to Navigation (Coast Guard)	400	
Total Project Cost	$ 204,400	(2)

(1) It is assumed that the cost of removing the beacon foundations, as estimated by the U. S. Coast Guard at $25,000 includes mobilization and demobilization charges.

(2) Excluding $8400 pre-authorization study cost.

ESTIMATE OF ANNUAL CHARGES

42. Estimated Annual Charges have been computed on the basis of a 50-year project life and at a 3-1/8 percent interest rate for both Federal and non-Federal funds.

43. The Annual Charges include an estimate for Federal maintenance of the improvement. This estimate is in addition to present annual maintenance charges of $28,000 for the existing project.

ANNUAL CHARGES

	Stratford Anchorage	Milford Anchorage	Combined
Federal			
Interest and Amortization	$3,480	$ 990	$ 4,010
Additional Annual Maintenance	5,000	2,000	7,000
Navigation Aids (Coast Guard)	240	-	240
	$8,720	$2,990	$ 11,250
Non-Federal			
Interest and Amortization	$3,480	$ 990	$ 4,010
Total Project Charges	$ 12,200	$ 3,980	$ 15,260

ESTIMATES OF BENEFITS

44. Sholaing in Stratford's natural anchorage has caused a migration of the larger recreational boats from the area to ports with more adequate anchorage depths. Loss of depth in the natural anchorage is attributed to post flood shoal conditions and to the accretion of silt deposited by eddies in the vicinity of the abandoned beacon. The dredging of the shoal material and the removal of the beacon foundation would reduce any flood restriction in the anchorage area and would tend to retard further accumulation of silt.

45. Local boating interests, concerned with the upper natural anchorage state that anchorage depth between the bridges was reduced by the disposal of fill removed from a cofferdam used during the construction of the Connecticut Turnpike Bridge. Sand, deposited by a recently constructed storm drain is also reducing the natural anchorage depth.

46. The recreational fleet fills existing marina and anchorage facilities to capacity and would receive little if any benefits from additional anchorage. Therefore, the benefits to be derived from the improvement would accrue to the prospective fleet consisting of new boats, transferred boats, and increases in transient boats.

47. Recreational benefits have been computed on the basis of the annual net return to the owners if the boats of the fleet were "for hire". In general, the net return would vary with the type and size of boat, and is expressed in terms of its average depreciated value. For purposes of this report, the ideal return is considered to be the maximum return that could be obtained with a 95 percent use of the harbor. The net return within this harbor varies from 12 percent for small boats to 9 percent for larger boats. The computation of the benefits considered the difference between the present percent of net return and 95 percent of net return that can be expected from the fleet after improvement.

48. The size of the present recreational fleet is an excellent indication of boating interest that exists in Stratford. The waterfront facilities are utilized to a point where the addition of new boats would cause serious congestion. Local interests predict that with provision of additional anchorage, 150 outboards and 75 cruisers and larger boats would be purchased and added to the locally based fleet. Local interests have advised that marinas in the Stratford anchorage area will be expanded to provide berths for about 90 of these new boats. In addition, it is assumed that one-half of the new outboards would utilize the ramp facilities for daily excursions and would require no anchorage space. The remaining 60 new boats will require anchorage and will derive $14,700 in annual benefits (Table I).

49. The loss of adequate anchorage depth in the river resulted in the migration of larger boats from Stratford to nearby Milford Harbor, Bridgeport, Black Rock, Essex and New London. Dredging an anchorage to a depth sufficient to accommodate these larger boats would enable an estimated 35 boats to return to Stratford. These boats would benefit from easier access by local boat owners and in a reduction of the travel time now required to get to the more distant harbors. A 5 percent increase in net return was assigned as the annual benefits in this case. The benefits are estimated to amount to $500. (Table II).

50. The Housatonic River attracts many transient boats throughout the boating season. The river provides an excellent sheltered harbor and, during periods of high tides, offers a scenic waterway for those who wish to venture inland. A Shakesperean theatre located in Stratford draws a portion of its audience from boating interests that travel from points as far away as

New Jersey. Local interests estimate that 815 transient boats make use of the harbor for an average of one to two days per season. This would amount to about 1400 boat days during the cruising season or the equivalent of seven locally based boats. These boats would have an annual benefit of $1500 (Table III).

51. The lack of adequate depths in the existing anchorages forces the larger transient boats to by-pass the Housatonic River for more suitable harbors. The provisions of a deeper anchorage would attract these larger boats in numbers estimated to equal one-third of the existing transient fleet. This would amount to an equivalent of three locally based boats with annual benefits of $3200. (Table IV).

52. At the present time, anchorage and marina facilities located between the bridges in Milford are filled to capacity. Local interests state that many requests for anchorage space must be refused each season due to the lack of suitable anchorage. Based on local advice, it is estimated that 24 new boats would be anchored in the area after improvement. This anchorage would tend to attract new locally -based boats rather than a transient or transferred fleet, as its location is remote from attractions on the waterway that normally draw such boats. It is assumed that no benefits would accrue from the existing fleet or from a transient or transferred fleet. The 24 new boats that could be anchored in the area would have an annual benefit of $4,000. (Table V)

53. The evaulated benefits from the improvements in the Housatonic River are summarized below:

Benefits From Increased Recreational Use of the:	General	Local	Total
Stratford Anchorage			
New Boats	$ 7,050	$ 7,050	$ 14,100
Transferred Boats	250	250	500
Existing Transient Boats	750	750	1,500
Attracted Transient Boats	1,600	1,600	3,200
Total	$ 9,650	$ 9,650	$ 19,300
Milford Anchorage			
New Boats	$ 2,000	$ 2,000	$ 4,000
Combined Project	$ 11,650	$ 11,650	$ 23,300

COMPARISON OF BENEFITS TO COST

54. The following table presents a comparison of benefits to cost for the components of the considered plan of improvement together with the overall improvement.

	Annual Benefits	Annual Costs	B/C Ratio
Stratford Anchorage	$ 19,300	$ 12,200	1.58
Milford Anchorage	4,000	3,980	1.01
Combined Project	23,300	15,260	1.53

55. If the plan of improvement were considered as a combined project, mobilization and demobilization charges would be prorated between the two anchorages thus making them both economically feasible. The Milford anchorage alone could not support the full mobilization and demobilization cost.

APPORTIONMENT OF COST AMONG INTERESTS

56. The benefits that would accrue through the improvement of the River are entirely recreational and would be considered 50 percent general and 50 percent local in nature. On this basis, local interests should share equally with the Federal government in the first costs of improvement. First costs of construction are estimated to be $204,000. Therefore, local interests should contribute in cash, 50 percent of this amount, or $102,000. As the plan of improvement is considered herein as a single combined project, no attempt has been made to proportion the local cost sharing between Stratford and Milford.

PROPOSED LOCAL COOPERATION

57. The benefits to be derived from the provision of the two anchorages are recreational in nature and would be apportioned as above. On this basis, local interests would be required to:

a. Make a cash contribution of 50 percent of the construction cost, currently estimated at $102,000.

b. Hold and save the United States free from damages that may result from construction and subsequent maintenance of the project.

c. Provide, without cost to the United States, all lands, easements and rights-of-way necessary for construction and maintenance of the project.

HARBOR: STRATFORD ANCHORAGE

TABLE I
BENEFITS TO NEW BOATS

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE AVERAGE $	DEPRECIATED VALUE TOTAL $	PERCENT RETURN IDEAL	% OF IDEAL GAIN Pres.	% OF IDEAL GAIN Future	VALUE $	ON CRUISE 180 DAY SEASON AVG DAYS	ON CRUISE 180 DAY SEASON % OF SEASON	ON CRUISE 180 DAY SEASON VALUE $	DAMAGES ELIMINATED AVG EXP. $	DAMAGES ELIMINATED AVG ELIM. $	DAMAGES ELIMINATED TOTAL VALUE $
RECREATIONAL FLEET														
OUTBOARD	10-20	30	1000	30000	12	0	95	11.4	3420					
Inboards	10-20	5	1600	8000	12	0	95	11.4	912					
Cruisers	15-30	5	2400	12000	9	0	95	8.55	1026	45	25	257		
	31-50	5	7000	35000	9	0	95	8.55	2993	45	25	748		
	51-60													
Aux. Sail	15-30	8	5000	40000	9	0	95	8.55	3420	45	25	855		
	31-40	6	7500	45000	9	0	95	8.55	3843	45	25	962		
	41-60	1	20000	20000	9	0	95	8.55	1710	45	25	428		
Sailboats	10-20													
	21-30													
	31-40													
	41-60													
CHARTER BOATS														
Cruisers	21-35													
	36-50													
	51-100													
TOTALS		60		190000				17329	17329-3250		3250	= $14079		Say $14100

Note: 1. Assume ½ outboards as trailer boats. 2. Boats depreciated 50%
3. Assume 55 new marina slots

HARBOR : STRATFORD ANCHORAGE

TABLE II

BENEFITS TO TRANSFERRED BOATS

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE AVERAGE $	DEPRECIATED VALUE TOTAL $	PERCENT RETURN IDEAL	PERCENT RETURN %OF IDEAL Pres.	PERCENT RETURN %OF IDEAL Future	GAIN	VALUE $	ON CRUISE AVG DAYS	ON CRUISE % OF SEASON	ON CRUISE VALUE $	DAMAGES ELIMINATED AVG EXP	DAMAGES ELIMINATED AVG ELIM	DAMAGES ELIMINATED TOTAL VALUE
RECREATIONAL FLEET															
~~Outboards~~	~~10-20~~														
Inboards	10-20	3	1600	4800	12	90	95	6	29						
Cruisers	15-30	12	2000	28800	9	90	95	45	130	45	25	32			
	31-50	10	7000	70000	9	90	95	45	315	45	25	79			
	51-60														
Aux Sail	15-30	5	5000	25000	9	90	95	45	113	45	25	28			
	31-40	1	7500	7500	9	90	95	45	34	45	25	8			
	41-60														
Sailboats	10-20	4	500	2000	12	90	95	6	12						
	21-30														
	31-40														
	41-60														
CHARTER BOATS															
Cruisers	21-35														
	36-50														
	51-100														
TOTALS		35		$138100					$633			$107			
									633-147 =			436	Say $500		

HARBOR: STRATFORD ANCHORAGE

TABLE III
BENEFITS TO EXISTING EQUIVALENT TRANSIENT FLEET

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE AVERAGE $	DEPRECIATED VALUE TOTAL $	PERCENT RETURN IDEAL	% OF IDEAL Pres.	% OF IDEAL Future	GAIN	VALUE $	ON CRUISE AVG DAYS	ON CRUISE % OF SEASON	VALUE $	DAMAGES ELIMINATED AVG EXP $	DAMAGES ELIMINATED AVG ELIM $	DAMAGES ELIMINATED TOTAL VALUE $
RECREATIONAL FLEET															
Outboard	10-20														
Inboards	10-20														
Cruisers	15-30														
	31-50	2	7000	14000	9	75	95	1.8	252						
	51-60	2	10000	20000	9	75	95	1.8	360						
Aux. Sail	15-30														
	31-40	1	7500	7500	9	75	95	1.8	135						
	41-60	2	20000	40000	9	75	95	1.8	720						
Sailboats	10-20														
	21-30														
	31-40														
	41-60														
CHARTER BOATS															
Cruisers	21-35														
	36-50														
	51-100														
TOTALS		7		$81500					$1467			Say $1500			

HARBOR: STRATFORD ANCHORAGE

TABLE IV
BENEFITS TO ATTRACTED TRANSIENT FLEET

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	DEPRECIATED VALUE AVERAGE $	DEPRECIATED VALUE TOTAL $	PERCENT RETURN IDEAL	% OF IDEAL Pres.	% OF IDEAL Future	GAIN	VALUE	ON CRUISE AVG DAYS	ON CRUISE % OF SEASON	VALUE $	DAMAGES ELIMINATED AVG. EXP. $	DAMAGES ELIMINATED AVG ELIM. $	DAMAGES ELIMINATED TOTAL VALUE $
RECREATIONAL FLEET															
Outboards	10-20														
Inboards	10-20														
Cruisers	15-30														
	31-50	1	7000	7000	9	0	95	8.55	599						
	51-60	1	10000	10000	9	0	95	8.55	855						
Aux. Sail	15-30														
	31-40														
	41-60	1	20000	20000	9	0	95	8.55	1710						
Sailboats	10-20														
	21-30														
	31-40														
	41-60														
CHARTER BOATS															
Cruisers	21-35														
	36-50														
	51-100														
TOTALS		3		$37000					$3164			Say $3200.			

HARBOR: MILFORD ANCHORAGE

TABLE V
BENEFITS TO NEWBOATS

TYPE OF CRAFT	LENGTH (Feet)	No. of boats	DEPRECIATED VALUE AVERAGE $	DEPRECIATED VALUE TOTAL $	PERCENT RETURN IDEAL	% OF IDEAL Pres.	% OF IDEAL Future	GAIN	VALUE $	ON CRUISE 180 DAY SEASON AVG DAYS	% OF SEASON	VALUE $	DAMAGES ELIMINATED Avg. Exper.	Avg. Elim.	Total Value
RECREATIONAL FLEET															
Outboard	10-20-	12	1000	12000	12	0	95	11.4	1368						
Inboards	10-20	5	1600	8000	12	0	95	11.4	912						
Cruisers	15-30	5	2400	12000	9	0	95	8.55	1026	45	25	257			
	31-50	2	7000	14000	9	0	95	8.55	1197	45	25	300			
	51-60														
Aux Sail	15-30														
	31-40														
	41-60														
Sailboats	10-20														
	21-30														
	31-40														
	41-60														
CHARTER BOATS															
Cruisers	21-35														
	36-50														
	51-100														
TOTALS		24		46000					4503			557			

4503 - 557 = $3946 Say $4000

d. Maintain existing public landings, open to all on equal terms, and provide, without cost to the United States, all necessary mooring facilities in the anchorage also open to all on equal terms, and

e. Agree to furnish spoil disposal areas, upon request of the Chief of Engineers, if it should be determined that such areas are necessary, and without cost to the United States, furnish any such areas required, including dikes, bulkheads and embankments as may be necessary for the initial construction and maintenance of the project.

58. By letter dated 18 August 1964, local interests in Stratford and Milford were advised of the above requirements of local cooperation and were requested to comment on the probability of compliance should the project be authorized. The Stratford Town Manager, in his letter dated 8 April 1965 and included in Appendix D, reported that the Town Council had accepted the recommendation of the Stratford Waterfront Authority which rejected the project. The City of Milford was advised that due to the rejection by Stratford, a project for Devon would not be economically feasible as a separate unit and that an unfavorable conclusion would be made unless additional supporting information was furnished to justify a separate improvement. No information was furnished.

COORDINATION WITH OTHER AGENCIES

59. All Federal, State and local Government agencies concerned in development of the waterway were notified of the public hearing held at Stratford, Connecticut, 5 March 1958. Subsequently, discussions were held with representatives and boating interests of Stratford and Milford. The U. S. Fish and Wildlife Service and its corresponding state agencies were consulted on the study and its conclusions. Fish and Wildlife reports are contained in Appendix C.

CONCLUSION AND RECOMMENDATION

60. The Division Engineer finds that the provision of additional anchorage in the Housatonic River is economically justified. He concludes that the needs of recreational boating could be met by constructing two anchorages, the first located in Stratford and the second in Milford. Both anchorages would be 6 feet deep with acres of 23 and 9 acres, respectively.

The benefits to recreational boating are sufficient to justify the work and to warrant Federal improvement as a combined project. Local interests are unwilling to meet the requirements of local cooperation. Therefore, the Division Engineer recommends no further navigational improvement of the Housatonic River at this time.

6 Incls
1. Map - Plate 1
2. Appendix A, Estimates of First cost
3. Appendix B, U.S. Coast Guard
4. Appendix C, U.S. Fish and Wildlife Service Report
5. Appendix D, Letter, Town of Stratford
6. Info - Sen 148

E. J. RIBBS
Colonel, Corps of Engineers
Acting Division Engineer

CORPS OF ENGINEERS

U. S. ARMY

HOUSATONIC RIVER CONNECTICUT

BASCULE BRIDGE
HOR. CL. 83'
VER. CL. 19'

RAIL ROAD BRIDGE

MILFORD LAUNCHING RAMP

CONN. TPK. (FIXED) BRIDGE
HOR. CL. 150' (NORTH SIDE)
HOR. CL. 100' (SOUTH SIDE)
VER. CL. 65'

COAL YARD

RIVERCLIFF YACHT CLUB

KELLEYS MARINA

N.Y.N.H. & H. R.R.

INTERSTATE HIGHWAY RT. 95

WASHINGTON AVE. (BASCULE) BRIDGE
HOR. CL. 125'
VER. CL. 32'

U.S. ROUTE 1A

CONNECTICUT TURNPIKE

FEDERAL CHANNEL 200 FT. WIDE

EXISTING FEDERAL CHANNEL 18 FT.

FLOOD EBB

U.S. ROUTE 1

POOTATUCK YACHT CLUB

FLADD & KAHLES MARINA

FERRY CREEK

ABANDONED BEACON

BONDS DOCK

BEAVER BROOK

NELLS ISLAND

STRATFORD

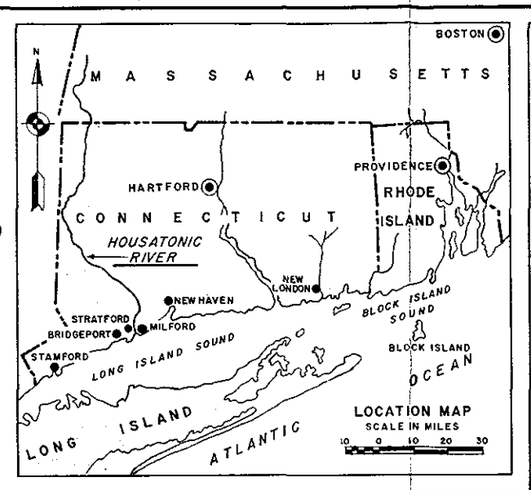
MILFORD

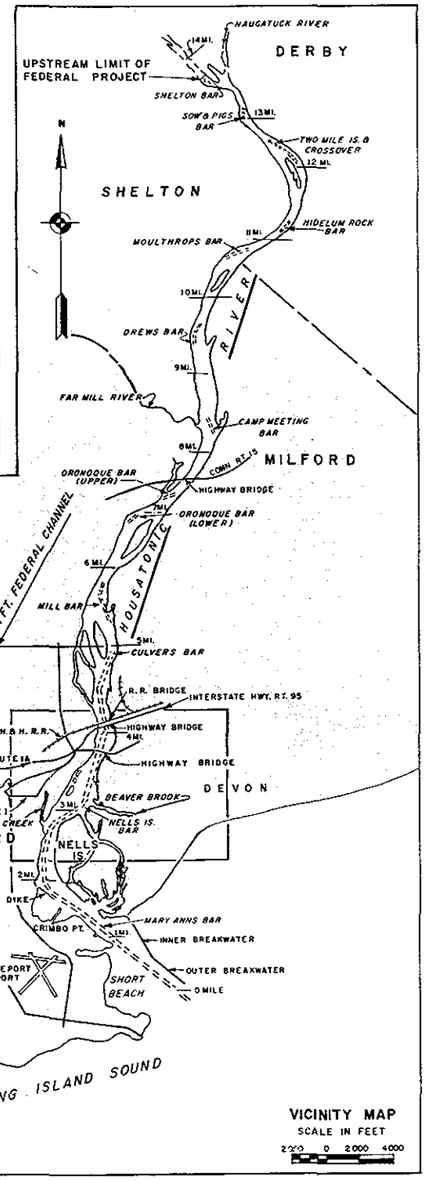
DEVON

LONG ISLAND SOUND

DESIRED IMPROVEMENT
NOT RECOMMENDED

MILFORD (DEVON) — Anchorage 9 acres, 6 feet deep
STRATFORD — Anchorage 23 acres, 6 feet deep





NOTES:
Soundings are in feet and tenths and are referred to the plane of Mean Low Water.
Hydrography from survey of Jan. & Feb. 1964.
Topography from survey of Jan., Feb. 1964 and enlargement of U.S.C.&G.S. chart number 219.

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

HOUSATONIC RIVER
CONNECTICUT

SHEET 1 OF 1 — SCALE IN FEET 3000 0 3000 6000 — SEPTEMBER 1965

APPROVED: Wm. Wm. Poole, CHIEF ENGINEERING DIVISION	TO ACCOMPANY SURVEY REPORT DATED: SEPT. 9, 1965
SUBMITTED: E. S. Gill, CHIEF, PLANNING AND REPORTS BRANCH	DRAWN BY S.J.B.
Fred J. Fogarty, CHIEF, RIVER AND HARBOR SECTION	CHKD. BY S.J.B.
Herman W. Peterson, CHIEF ENGINEER	FILE NO. Hc. 495

PLATE NO. 1

APPENDIX A
ESTIMATES OF FIRST COST

1. Estimates of first cost have been prepared for the considered plan of improvement. The plan consists of two anchorages, one located in Stratford and the other in Milford. The anchorages would be 6 feet deep and would have areas of 23 and 9 acres respectively.

2. Probings taken in 1964 indicate the bottom materials to be mud, sand, and a small amount of stone which forms the foundation of an abandoned navigation beacon. Dredging quantities have been estimated in terms of in-place measurement and include an allowance of 1 foot for overdepth dredging. Allowable side slopes are 1 vertical on 3 horizontal. The estimate of costs for the plan selected as the most feasible is detailed as follows:

PROJECT COST ESTIMATE

Cost Account Number			Cost Estimate
09	Stratford anchorage		
	Dredging 70,200 c.y. of mud and sand @$1.65		$ 116,000
	Removal of beacon foundation @ 1 job lump sum		10,000
	Milford anchorage		
	Dredging 15,500 c.y. of mud and sand @$1.65		25,600
			$ 151,600
	Contingencies @15%		23,000
			$ 174,600
	Engineering & Design	$ 15,000	
	Supervision & Administration	14,400	
			29,400
			$ 204,000
	Aids to Navigation (Coast Guard)		400
	TOTAL PROJECT COSTS		$ 204,400*

*Excluding Pre-Authorization Costs of $8,400

Summary of Costs	
Federal ($204,000 x .50)	$ 102,000
Non-Federal ($204,000 x .50)	102,000
	$ 204,000

APPENDIX B

UNITED STATES COAST GUARD

ADDRESS REPLY TO:
COMMANDER
3RD COAST GUARD DISTRICT
U.S. CUSTOM HOUSE
NEW YORK 4, N.Y.

o-1
3260
20 July 1964

From: Commander, Third Coast Guard District
To: U. S. Army Engineer Division, New England
Corps of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Subj: Survey Report on Improvement for Housatonic River, Connecticut.

Ref: (a) Corps of Engineers ltr NEDED-R dtd 26 June 1964.

1. In accordance with the request contained in reference (a), you are advised that the proposed Housatonic River, Connecticut project will require the following aids to navigation:

2ea 5th Class can buoys	$266.00
lea 5th Class nun buoy	$136.00

Annual maintenance would be $240.00 thereafter.

2. Removal of the foundation of the former Housatonic River Light 7 is estimated at $25,000.

3. The above estimates are approximate and subject to change with any change of project or material costs.

J. MAZZOTTA
By direction

APPENDIX C

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
U. S. POST OFFICE AND COURTHOUSE
BOSTON, MASSACHUSETTS 02109

June 17, 1965

Division Engineer
U. S. Army Engineer Division, New England
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

This is our conservation and development report on your study of possible modifications of the existing Federal project in the Housatonic River, at Stratford and Devon, Fairfield and New Haven Counties, Connecticut. Your study is being made under authority of the Resolution of the House Committee on Public Works dated April 12, 1958. This report was prepared under authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-666 inc.), in cooperation with the Connecticut State Board of Fisheries and Game and State Shell Fish Commission. Those agencies concurred in the report, as indicated by letters dated June 7 and 9, 1965, respectively.

We understand that deepening two natural boat anchorages to a depth of six feet at m.l.w. is being considered. The Stratford anchorage will be located in the Stratford area northwest of Nells Island, adjacent to the west bank of the river and west of and adjacent to the 18-foot channel. It will extend along the river about 3,000 feet and be generally 500 feet wide and extend about 4,000 feet north of Ferry Creek. The downstream end of this anchorage will be 1/4 mile upstream from the 10-acre State oyster bed off Bond's wharf. The Devon anchorage will be located between the new Connecticut Turnpike Bridge and the Washington Avenue Bridge (Rte. 1), adjacent to the east bank, and upstream from the Stratford anchorage. It will extend 1,500 feet along the east bank and be about 250 feet wide. The dredging period will last about three and one-half months.

Approximately 90,000 cubic yards of material will be removed. We understand that tentative plans are to use bucket dredging with disposal in deep waters in Long Island Sound. The spoil could be removed by hydraulic dredging if local interests offer alternate disposal areas.

Fish species found in the Housatonic River estuary include striped bass, white perch, American smelt, bluefish, Atlantic mackerel, American eel, winter flounder, summer flounder, tautog, sea bass, and scaup. Extensive sport fishing is found in the harbor area and along the shore. The plan

being considered is not expected to have significant effects upon finfish in the Housatonic River.

Relatively abundant populations of oysters and small populations of hard clams and soft clams occur in the estuary. The oyster is the most important species and supported considerable activity in the past. The resource has dwindled, but there is sufficient propagation to support about 12 small commercial oyster boats with one- or two-man crews on a part-time basis. Most of the oysters occur downstream from the project area. The river is polluted to the extent that the shellfish cannot be sold directly to the market. They are sold for transplanting in the Norwalk Maturing Area. Two hundred bushels of mature oysters were planted in the Connecticut State Shell Fish Commission's 10-acre oyster spawning bed in the spring of 1964. The market value of mature oysters was $17.00 per bushel to the fishermen at that time.

The estimated annual production of seed oysters from the area which could be affected by the project is about 6,000 bushels. From late May to November the fishermen take approximately 500 bushels apiece. These seed oysters are sold for about $4.00 per bushel.

The 630-acre Nells Island Marsh, located just southeast of the Stratford anchorage area, is high-value waterfowl habitat owned by the State of Connecticut. The State-owned marshlands on Popes Island, Long Island, Carting Island, Peacock Island, and adjacent marsh along the west bank, which are located about one mile upstream from the Devon anchorage, are high-value waterfowl areas. These and the small remaining areas of salt marsh fringing the river in the project area are of importance to fish, shellfish, and waterfowl. The Housatonic estuary receives heavy waterfowl use for resting, nesting, and feeding. Dabbling ducks most frequently seen in the area are black ducks and mallards, while green-wing, teal, and baldpate are seen in lesser numbers. Scaup are the most abundant diving ducks which use the area; however, American goldeneye, canvasback, and bufflehead are seen frequently. Nells Island also provides excellent habitat for shorebirds, particularly Virginia clapper, king, and sora rail. This is one of the most heavily hunted areas for waterfowl and rail along the Connecticut coast. It is estimated that about 50 ducks use Nells Island each day between the end of August and the first of March. There is a small amount of waterfowl nesting on the island each year. An estimated 300 scaup use the estuary area each day from about December 1 to March 15 each year. The annual use of Nells Island by hunters amounts to about 900 hunter-days. There are also about 800-1000 man-days attributed to nature activities on Nells Island. The value assigned to waterfowl hunting is $4.00 per man-day and to nature study and bird-watching $.50 per day.

The State Board of Fisheries and Game has carried out a Phragmites (reed grass) control program for waterfowl management on Nells Island since 1961 at a cost of several thousand dollars.

The small oyster boats using the Housatonic River are generally moored in shallow waters in coves, bays, and at local piers. There are no large, deep-draft oyster boats using the estuary and we expect that none will use it as a result of improved anchorage. Since the smaller shallow-draft oyster boats do not need deep anchorage areas, there will be no benefit to this fishery from the project. No commercial fishing boats are using this harbor and we expect that none will use it in the future.

Removal of material to create the two anchorage areas will, of itself, have relatively little effect upon fish and wildlife resources, provided the State shellfish bed is not disturbed. The resultant silting, however, will cause significant losses of oysters in the estuary if dredging operations are undertaken during the oyster spawning season. The period of oyster spawning generally starts about June 1. Young oysters begin to set (attach themselves to the substrate) by July 15, and the setting period is usually completed by October 1. Siltation will cause the least harm to oysters if dredging is performed from December 1 to June 1.

We have been advised by your office that dredging from December 1 to June 1 will not be practical from the engineering standpoint. If dredging is carried out between June 1 and October 1, as indicated by your office, it could result in a loss of two annual crops of seed oysters or about 12,000 bushels, plus the loss of at least 200 bushels of mature oysters on the State bed. The degree of loss will depend upon the density of silt in suspension and the depth and location of silt deposition on the bottom. In view of these anticipated losses, the spawning stock of oysters should be removed from the State shellfish bed prior to dredging operations and replaced after completion of the project. The removal and replacement of these oysters should be funded as a project cost estimated at $3,000.

There is no practical way to temporarily remove the oysters from the natural beds in the estuary. If dredging must be accomplished during summer or fall, it should be started at the downstream end of the anchorage and progress upstream. If this is done, the dredging activity will be further upstream from the remaining natural oyster beds during the critical oyster setting period. This will allow for maximum silt deposition before it reaches the oyster beds and will reduce adverse silt accumulation on the State bed.

Your letter of April 29, 1965 indicated that the matter of the dredging period and the spoil disposal procedure can be coordinated during the planning phase for construction. We agree that dredging dates and details of the spoiling procedure can be coordinated at that time. Spoil from the dredging should not be placed upon State-owned marshlands at Nells Island or on the other Housatonic River marsh islands previously mentioned. The remaining marshes in the project vicinity are small, and will accommodate only a very small percentage of the spoil. It has been found that placing spoil upon areas such as these destroys their fish and wildlife values and encourages invasion of reed grass which will be inimical to the State's program for the control of this vegetation. Spoil from the project should be placed only upon uplands or disposed of at the Milford Dumping Ground in Long Island Sound about six and one-half miles southeast of the river's mouth.

We recommend:

1. That the oysters in the State oyster spawning bed be removed prior to dredging operations and replaced after completion of the project.

2. That the expense of removal and replacement of the oysters be funded as a project cost, chargeable to project beneficiaries.

3. That the dredging dates and spoil disposal details be coordinated with the State Board of Fisheries and Game, the State Shell Fish Commission, and this Service during the planning phase for construction.

4. That if any dredging is necessary during the period June 1 to October 1, it start at the downstream end of the anchorage areas and proceed upstream.

5. That all spoil be disposed of at the Milford Dumping Ground or upon uplands.

We plan no further studies on this project unless spoil sites are considered which have not been mentioned in this report. Please advise us immediately if any other sites for spoiling are suggested, so that we may assist you in the conservation and development of fish and wildlife resources. We will assist you with details of spoil disposal and with planning appropriate dredging dates during the planning phase for construction.

Sincerely yours,

Thomas A. Schrader
Acting Regional Director
Bureau of Sport Fisheries & Wildlife

John T. Gharrett
Regional Director
Bureau of Commercial Fisheries

TOWN OF STRATFORD

CONNECTICUT
OFFICE OF TOWN MANAGER

April 8th, 1965

U. S. Army Engineer Division
Corps of Engineers
424 Trapelo Road
Waltham 54, Mass.

Atten: Mr. Armour

Gentlemen:

This is to advise you that the Stratford Town Council on March 8, 1965 received a report from the Stratford Waterfront Authority concerning the proposed Housatonic River anchorage dredging project. This report did not recommend Town participation in this proposed Federal project.

The Town Council's acceptance of this report is in effect a rejection of the project. I do not anticipate any reconsideration of this proposal in the near future.

I am enclosing a copy of the Waterfront Authority's report which outlines their reasons for recommending against the dredging project.

If I can be of further assistance to you please do not hesitate to call.

Very truly yours,

Richard E. Blake

Richard E. Blake,
Town Manager

REB:FCB

Encl.

D-1

"COUNCIL-MANAGER GOVERNMENT SINCE 1921"

TOWN OF STRATFORD

CONNECTICUT

WATERFRONT AUTHORITY

RECEIVED
MAR 1 1965
TOWN MANAGER'S OFFICE

Feb 26 1965

Richard E. Blake
Town Manager
Stratford Conn.

Dear Mr. Blake:

At the last meeting of the Waterfront Authority held on Monday February 22 the matter of the proposed dredging of the Housatonic River was discussed. Since the public hearing at which the Army Engineers explained the project, we have individually talked to many people who are boat owners and have had the opportunity to give the proposal more study.

In our letter to you dated Sept 30 we expresses ourselves as being in favor of the project provided that certain conditions could be met. These were principally parking and shore installation to provide adequate access to the area etc. etc. An examination of shorefront property owned by the Town of Stratford shows that such adequate shore facilities could not be installed in the near future. The question of proper moorings and their maintenance is of much concern and finally is the growing realization after talking to many boat owners the the trend is definitely away from moorings and toward the use of slips. This is a more costly way to secure a boat but people seem to be willing to pay for convenience.

For these reasons we feel that it would be a mistake for the town to pay for the part to be assessed for the proposed dredging.

We take this opportunity however, to draw to your attention the great desirability of action by the Town Council, to acquire land on the river which would be suitable for a Marina.

Each year that passes makes such acquisition more difficult and the need is growing. We do not advocate placing the Town in competition with established marinas. We would not suggest the sale of fuel or supplies at such an installation, nor do we overlook the fact that in our opinion such an installation would create much business for commercial establishments on the river.

We think that the immediate need is for land for future development.

Yours very truly,

Jack Wardman Chairman

HOUSATONIC RIVER, CONNECTICUT

Information Called for By Senate Resolution 148, 85th Congress
Adopted 28 January 1958

1. Navigation Problem. - The Housatonic River originates in the Berkshire Hills of northwestern Massachusetts and flows in a southerly direction to Long Island Sound. The mouth is located 5 miles east of Bridgeport Harbor. The river is tidal for a distance of 14.5 miles to a lock and dam at Shelton. The river can be navigated by shallow draft boats for three miles above the dam. A Federal channel extends from the Sound for 13.75 miles to the confluence of the Naugatuck and Housatonic Rivers. The design depth of the channel is 18 feet from the sound to Culvers Bar and thence 7 feet to its end.

2. The principal navigation problem in the Housatonic River today evolves from inadequate anchorage space for the many recreational boats that use the waterway. Shoaling since the 1955 hurricane has reduced natural anchorage space to the extent that congested mooring conditions have resulted in infringement upon the 18-foot channel. The loss of adequate depth in the river has caused a migration of the larger boats to other harbors.

3. Improvements Considered, Costs and Local Cooperation. - The selected plan of improvement would provide for two anchorages, one to be located in Stratford and the other in Milford. The anchorages would be 6 feet deep and have areas of 23 and 9 acres respectively. The estimated cost of improvement totals $204,000. As the improvement would be entirely recreational in nature, the benefits would be 50 percent local and 50 percent general. On this basis, first cost of construction was apportioned equally. Computed average annual benefits were $19,300 for the Stratford anchorage and $4,000 for the Milford anchorage with a total annual benefit for the combined project of $23,300. On this basis, local interests would be required to:

a. Make a cash contribution of 50 percent of the construction cost currently estimated at $102,000.

b. Hold and save the United States free from damages that may result from construction and subsequent maintenance of the project.

c. Provide, without cost to the United States, all lands, easements, and rights-of-way necessary for construction and maintenance of the project.

d. Maintain existing public landings, open to all on equal terms, and provide without cost to the United States, all necessary mooring facilities in the anchorage also open to all on equal terms, and

e. Agree to furnish spoil disposal areas, upon request of the Chief of Engineers, if it should be determined that such areas are necessary, and, without cost to the United States, furnish, any such required, including dikes, bulkheads and embankments as may be necessary for the initial construction and maintenance of the project. By letter dated 18 August 1964, local interests in Stratford and Milford were advised of the above requirements of local cooperation. The Town Manager of Stratford, in his letter dated 8 April 1965, advised the Division Engineer that Stratford had rejected the proposed project.

4. Discussion. - The navigation study revealed the inadequacy of the waterway for existing and prospective recreational fleet. The provision of two additional anchorages in the river would be an economically justified project providing that the improvements be considered as a single combined project. Local interests have stated that the requirements of local cooperation could not be met. Therefore, the Division Engineer recommends no navigational improvement in the Housatonic River, Connecticut at this time.